DOCUMENT RESUME

ED 162 111 CE 018 288

TITLE Industrial Education. Graphic Arts. [Grade 9].
INSTITUTION Parma City School District, Ohio.
NOTE 17p.; For related documents see CE 018 289-292

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Career Opportunities; Curriculum Guides; *Educational Objectives; Equipment; Grade 9; *Graphic Arts; *Industrial Education; Junior High Schools; *Learning Activities; Performance Based Education; *Photography; Reference Materials

ABSTRACT

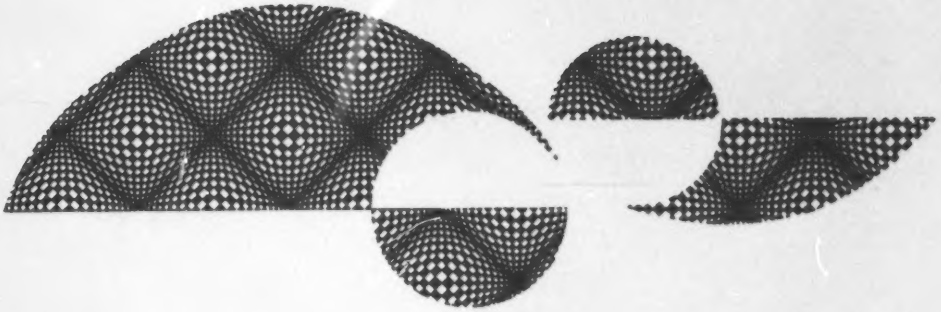
Part of a series of curriculum guides dealing with industrial education in junior high schools, this guide covers the topic of graphic arts and is intended to be used in grade 9. The major areas of study included are relief printing, silk screen, offset lithography, and photography. Twenty-six goals are identified for the students, who will demonstrate a knowledge of: (1) the relationship between graphic arts and the printing industry, (2) types of graphic reproductions used in the printing industry, (3) relief printing, (4) printing measurement, (5) foundry type and spacing material, (6) type classification, (7) hand composition, (8) proofing, (9) imposition and lock-up, (10) presswork, (11) type distribution, (12) relief cuts for printing, (13) screen printing, (14) tools required for screen printing, (15) preparing art work copy, (16) types of stencil used for screen printing, (17) screen process printing, (18) lithographic printing, (19) types of masters used for offset lithography printing, (20) the offset lithography press, (21) photography, which is covered in a separate mini-course guide (CE 018 290), (22) process photography, (23) stripping and layout procedures, (24) printing inks, (25) bindery process, and (26) career opportunities in graphic arts-related fields. A selection of lab activities is provided as well as lists of equipment and reference sources. (ELG)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED162111

INDUSTRIAL EDUCATION

GRAPHIC ARTS



Parma City Schools

CE 018 388

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

Jack D. Ford

INDUSTRIAL EDUCATION

GRAPHIC ARTS - Grade 9

Program Description

Graphic Arts is an elective course offered to all ninth grade boys and girls at each of the six junior high schools. Approximately 400 students are annually enrolled in the course with an average of 24 students per class. Classes meet fifty minutes daily, five days a week for on semester. Upon completion of the course, each students receives ½ credit towards high school graduation.

Graphic Arts at the ninth grade is exploratory in nature. In the area of graphic arts, the students will become acquainted with the various basic procedures and techniques of printing activities. The major areas of study will include relief printing, silk screen, offset lithography, and photography.

Goals

1. The students will understand the relationship between various graphic arts activities and the work of the printing industry.

   Objective 1 - Given a list of career occupations, the students will discriminate those areas of industry which have a direct relationship with graphic arts.

   Objective 2 - Given a list of work habits and traits, the students will choose those work habits and traits which are required to be a successful printer.

2. The students will have a knowledge of the various types of graphic reproductions used in the printing industry.

   Objective 1 - The students will identify the various types of printing used in the printing industry (ie. - letterpress, silk screen, lithography).

   Objective 2 - The students will explain the historical development of beginning printing to the current methods of the printing industry.

3. The students will have a knowledge of the nature of relief printing.

   Objective 1 - Given a list of movable type characteristics, the students will explain the advantage or disadvantage of each

   Objective 2 - Given examples of various kinds of printed material, the students will identify correctly those printed in relief.

Objective 3 - The students will define correctly the process and mechanics of relief printing.

4. The students will have a knowledge of measurement used in printing.

Objective 1 - The students will explain the need for a special measuring system to be used for printing.

Objective 2 - Given examples to be measured by the point system, the students will correctly measure to within one point.

5. The students will have a knowledge of foundry type and spacing material.

Objective 1 - Given a piece of foundry type, the students will identify all parts of the single type.

Objective 2 - Given various pieces of foundry type and a measuring rule, the students will correctly measure the size of each type.

Objective 3 - The students will explain the use of spacing material when setting type.

Objective 4 - Given examples of spaces and quads, the students will correctly identify each.

Objective 5 - Given examples of leads and slugs, the students will correctly identify each.

6. The student will have a knowledge of type classification.

Objective 1 - Given examples of type styles, the students will identify correctly the five basic type styles (Roman, Text, Sans Serif, Italic, and Script).

Objective 2 - Given examples of a type face, the students will correctly explain the need for classifying types into families.

Objective 3 - Given a font of type, the students will correctly identify the various kinds of type that is included in the font.

Objective 4 - Given examples of job cases, the students will explain the need for and arrangement of a type case specified by printing standards.

7. The students will demonstrate a knowledge of hand composition.

Objective 1 - Given type and a composing stick, the students will correctly set lines of type.

Objective 2 - Given type and a composing stick, the students will justify lines of type (centering, quading-out, and solid matter) specified by the teacher's example.

8. The students will understand the need for proofing.

   Objective 1 - Given type and proof press, the students will pull a proof as specified by the teacher's example.

   Objective 2 - Given a printed proof, the students will read the proof and make any necessary corrections.

9. The students will have an understanding of imposition and lock-up.

   Objective 1 - Given type form and furniture, the students will layout the form according to the original design or dummy layout.

   Objective 2 - Given type form, furniture, quoins and chase, the students will lock-up the form according to printing standards.

10. The students will demonstrate a knowledge of presswork.

   Objective 1 - Given examples of different types of platen presses, the students will compare all of the advantages and disadvantages of each.

   Objective 2 - Given a platen press, the students will identify its parts as specified by the instructor.

   Objective 3 - Given a press and locked up type form, the students will perform all necessary make-ready operations needed in preparation of press operation.

   Objective 4 - Given a job to print, the students will operate the press and run the job as specified by both printing standards and safety standards.

   Objective 5 - Given a press to clean, the students will clean and perform the daily maintenance of the press as specified by the teacher.

11. The students will have an understanding of type distribution.

   Objective 1 - The students will explain the need for correct distribution of type into type cases.

   Objective 2 - Given type to be distributed, the students will correctly distribute type according to the printing standards.

12. The students will have a knowledge of relief cuts for printing.

   Objective 1 - Given a linoleum or wood block and original art work, the students will transfer the art work in mirror image to the block according to the teacher's specifications.

Objective 2 - Given linoleum or wood block and hand cutting tools, the students will cut the design in relief following safety standards.

Objective 3 - Given a platen press or copying press and cut block, the students will print reproductions of the block according to printing standards.

13. The students will have a knowledge of the nature of screen printing.

Objective 1 - Given examples of printed material, the students will be able to distinguish all the material printed by the silk screen method.

Objective 2 - The students will explain the need for and the advantages of silk screen printing over other printing processes as specified by the teacher.

Objective 3 - The students will define correctly the process and mechanics of screen printing.

14. The students will have a knowledge of the various tools required for screen printing.

Objective 1 - Given tools for cutting hand stencils, the students will discriminate in choosing the appropriate tool for the given job as specified by the instructor.

Objective 2 - Given a frame and stencil fabric, the students will replace the fabric, as needed, followed by careful use of the screen as specified by the teacher's example.

Objective 3 - Given a squeegee, the students will maintain edge sharpness and cleanliness as specified by the teacher's example.

15. The students will recognize the need for preparing art work copy.

Objective 1 - The students will explain the need for original art work copy in preparation for stencil printing as well as during the set-up of stencil printing.

Objective 2 - Given paper and drawing media, the students will develop art work to be used for screen printing preparation.

16. The students will have an understanding of the different types of stencils used for screen printing.

Objective 1 - Given a choice of hand cut stencils (paper, lacquer, water base), the students will cut out the stencil to a proper degree of accuracy and neatness to insure stencil adhesion to the screen.

Objective 2 - Given a photo stencil, positive, chemical, and exposure cabinet, the students will expose and develop the stencil to a degree of accuracy and neatness to insure adhesion to the screen.

Objective 3 - Given liquid or crayon tusche and glue, the students will prepare a stencil printing to a degree of accuracy and neatness to insure proper screen printing.

Objective 4 - Given either a hand-cut stencil or photo stencil and screen, the students adhere the stencil to a degree of accuracy and neatness to insure proper screen printing.

17. The students will demonstrate a knowledge of screen process printing.

Objective 1 - Given a stencil adhered to a screen and block-out material, the students will block-out areas of the screen in preparation for printing, to a degree of accuracy and neatness specified by the teachers.

Objective 2 - Given a prepared screen and an area for printing, the students will position the screen in relation to the printing stock to insure accurate print registration.

Objective 3 - Given a prepared screen, ink, squeegee, and stock, the students will select and use the correct ink and squeegee in producing a screened print to a degree of accuracy and neatness specified by printing standards.

Objective 4 - Given a screen to clean, solvent, and rags, the students will clean the screen using the correct solvent to a degree of neatness specified by the teacher.

18. The students will have an understanding of the nature of lithographic printing.

Objective 1 - Given examples of printed material, the students will be able to distinguish all the material printed by the lithographic process.

Objective 2 - The students will explain the need for and the advantages of lithography over other printing processes as specified by the teacher.

Objective 3 - The students will define correctly the process and theory of lithography printing.

19. The students will have a knowledge of the types of masters used for offset lithography printing.

Objective 1 - Given examples of direct image paper masters, the students will explain their use as a means for producing printed

materials as specified by the manufacturer.

Objective 2 - Given a blank direct image master, the students will produce a master for printing as specified by the manufacturer.

Objective 3 - Given examples of aluminum masters, the students will explain their use and advantages as specified by the teacher.

Objective 4 - Given an unexposed aluminum master, negative, exposure cabinet, and chemicals, the students will expose and develop the master as specified by the manufacturer.

20. The students will demonstrate an understanding of the offset lithography press.

Objective 1 - Given an offset press, the students will identify the parts of the press as specified by the instructor.

Objective 2 - Given an offset press, ink, and repelex solution, the students will prepare the press for printing as specified by the manufacturer.

Objective 3 - Given an inked offset press, stock, and master, the students will adjust the press for registration according to the manufacturer's suggestions.

Objective 4 - Given a job to run, the students will operate the offset press and run the job according to both printing standards and safety standards.

Objective 5 - Given an offset press to clean, the students will clean and perform the daily maintenance of the press as specified by the teacher.

21. The students will have a knowledge of photography.

NOTE: Refer to the six week photography mini-course memorandum for specific goals and objectives.

22. The students have an understanding of process photography.

Objective 1 - Given a copy camera, the students will identify and explain the parts of the camera.

Objective 2 - Given a capy camera, film, and copy to shoot, the students will photograph the copy according to manufacturer's suggestions.

Objective 3 - Given an exposed piece of film and developing chemicals, the students will develop the film according to manufacturer's suggestions.

Objective 4 - Given a negative and unexposed film, the students will expose

and develop the film to produce a positive according to the manufacturer's suggestions.

23. The students will have a knowledge of stripping and layout procedures.

    Objective 1 - Given a printing job to design and layout, the students will prepare the original copy using appropriate design concepts such as arrangement, contour, unity, harmony, color, proportion, and balance.

    Objective 2 -Given a negative for stripping and opaque, the students will opaque the negative to a degree of neatness and accuracy specified by the teacher.

    Objective 3 - Given a negative to strip-in, masking sheet, and cutting tools, the students will strip-in the negative to a degree of neatness and accuracy specified by the teacher.

24. The students will have a knowledge of printing inks.

    Objective 1 - Given examples of various kinds of printing inks, the students will distinguish between the various inks according to the use of each ink.

    Objective 2 - Given a list of basic printing ink ingredients, the students will explain their need for use.

25. The students will have a knowledge of bindery processes.

    Objective 1 - Given examples of various bindery techniques, the students will identify and explain their purposes.

    Objective 2 - Given paper stock, padding compound, and padding board, the students will pad the stock to a degree of neatness and accuracy specified by the teachers.

    Objective 3 - Given bindery materials and equipment, the students will construct a notebook cover or case to a degree of neatness and accuracy specified by the teacher.

    Objective 4 - Given paper stock and paper cutter, the students will cut and/or trim stock to within 1/64".

26. The students will recognize the various career opportunities available to them in graphic arts related fields.

    Objective 1 - The students will interact through discussion with a guest speaker on the topic of career exploration in graphic arts.

    Objective 2 - Given a career survey form, the students will interview parents, friends, and neighbors to determine the various roles graphic arts plays in their vocations.

Objective 3 - The students will participate in a project or field trip to explore career opportunities in graphic arts.

Selected Lab Activities

The following lab activities are given only to serve as examples of some of the various kinds of work that can be done by the students in order to achieve the objectives of the course. Each instructor should use his discretion in selecting these lab activities as well as supplementing his own ideas in an attempt to meet the needs of each of his students.

Relief Printing: Hand set type

- business cards
- calling cards
- letterheads
- return address (envelopes)
- memo pads
- occasion cards and envelopes
- book marks
- wood cuts
- linoleum blocks

Silk-Screen:

- decals
- textiles (T-shirts, sweatshirts)
- occasion cards
- plaques and pictures
- glass etching
- award ribbons
- posters
- charts
- pennants

Lithography:

- memo pads
- ditto pads
- leafletts
- pamphlets and booklets
- targets
- business cards
- school newspaper
- fliers

NOTE: Activities and projects may be integrated and include multi-colors, die-cutting and binding to further develop knowledge and skills in the students.

GRAPHIC ARTS: Equipment and Small Tool List

BITS, high speed drill - assorted 1/16" to ½" by 32nds

BRAYER, 6" - with neoprene rubber roller

BRUSHES, artists opaque - #0, #1, #3
flat padding - 2" wide
round glue - copper bound, vulcanized in rubber, 1" dia., 1½" dia.
type and plate - brass wire bristles, 2 3/8" x 4 1/8"

CABINET, mobile press - storage of press, tools, inks, knives
film storage - darkroom location, film and paper
school type - No. 2094-113, floor space 33" x 42", lead and slug bank-optional, locking device-optional, can accomodate 16 or 22 cases, American Printing Supply
storage - for plates, negatives, flats, and artwork, floor type, narrow, many shallow drawers, work area top, heavy gauge steel

CAMERA, vertical copy - Goodkin, Kenro, Robertson

CAN, Justrite oily waste - 10 gal. capacity
Justrite plunger - 1 qt. capacity
Justrite safety benzene - type No. 1, 1 pt., 1 qt.
Justrite safety - No. 10809, faucet type for bulk storage
Plews oiler - 6 oz. capacity with 4" or 7" spout, 16 oz. capacity with 4" or 7" spout
Success benzene - heave gauge brass, spring nozzle, 1 pt., 1 qt.

CASE, type - minimum contents of each case font-complete assortment of caps, lower case, figures, 3 pkgs. lower case letters, 2 pkgs. caps, 2 pkgs. figures

CASES, type - California job case, rule case, double yankee case, lead and slug case

CIRCLE, protype photo

CLAMP, Apsco heavy duty hinge for screening frames

CLAMPS, "C"

COUNTER, adjustable pad

CUTTER, bow compass
Dual Flex - for parallel lines
jumbo Kraft paper - 24" to 36" capacity, standard blade
paper - Challenge, style 265HA, hand clamp, hydraulically operated, 26½" behind knife
Rouse lead and rule - No. 40
table - hand paper, 24" x 24"

DISPENSER, cellophane tape - to hold two rolls of tape
double coated tape
masking tape

DRILL, electric portable - 3/8" chuck
paper

FOLDERS, genuine bone

FRAME, hack saw

FURNITURE, font of - No. 13744-A, American Printing

GALLEYS, rustproof, double wall, 8 3/4" x 13"

GAUGE, type or line - stainless steel, 12", one side 6 and 12 pt, opposite side inches

HAMMER, ball pein
claw

IRON, tacking - thermostatic control, teflon coated base

JOGGER, paper

KEYS, quoin - double wedge, high speed

KNIFE, Ulano swivel

KNIVES, Grifhold stencil
ink - 8" Lawson

LOCKS, magnetic galley

MACHINE, numbering - forward and backward, gothic or roman
wax coating

MALLET, rawhide - No. 4, 2" dia. x 3½" head, 11 oz.

PAPER, Tupan - thickness .006, 9" diam rolls, stock widths 12, 15, 18, etc.

PEN, Koh-i-noor Graphos or Draftech set

PINS, Megills spring gauge

PLANER, wood - level type forms, 6", leather top

PLATE, electric hot

PLATE MAKER, Nu Arc flip top - 5 sizes available, offset and silk screening

GRAPHIC ARTS: Equipment and Small Tool List cont'd

PLIERS, diagonal - heavy duty
needle nose
straight nose

POSTS, aluminum binder - ½' - 3/4", 1" - 1½", 3/4" - 1½"

POT, electric glue - copper container, thermostat, 1 qt. capacity

PRESS, Chandler & Price - model N, motor driven, hand fed, 8" x 12" chase inside
book - heavy duty
offset duplicator - multilith 1250, chrome cylinders
padding
pilot - Chandler & Price, hand operated, 6½" x 10" chase inside
proof - 13" x 18" bed approx., base cabinet to fit

QUOINS, double wedge - No. 1, No. 2
high speed - 3", 4½", 6", 7½", 9", 12"

RACK, chase - No. 5240-1803, American Printing Equip. & Supply
drying - folding racks

REGLETS, font of - No. 13734, American Printing

RULE, lead - full 2 point, 1 point or 2 point body, hairline, dotted line
steel -cutting, perforating, scoring or creasing

SCREWDRIVER, Phillips - assorted set
standard - assorted set

SEALER, gummed tape

SHEARS, bent - heavy duty, 8", 10", 12"
paper - for light cutting

SINK, offset plate and silk screen - plate making, screen developing, washing and removal

SOLUTION, cleaning - for number machine cleaning, box

SPACES, thin - brass and copper, assortment

STAPLER, Acme - hand power
foot power - floor model 12" throat, 3 models (No. 9 foot power, No. 9 Duplex, and No. 6½ foot power)

STICK, Rouse pica - stainless steel, 6" stick - 23 pica maximum
8" " - 36 " "
10" " - 48 " "
12" " - 60 " "
15" " - 75 " "

STOOL, steel

SQUARE, Graphic Arts L or framing - 12" x 24"
stainless steel T - 30" long

SQUEEGEES, gold standard aluminum - style A handle, advance process

TABLE, drying rack and stock - No. 5131-3017, American Printing Equip. & Supply
light - Nu Art, floor or table top, from 18" x 20" to 42" x 62"
school imposing (stone) - American Printing Equip., No. 3978-1031, iron top 31" x 39", reglet storage, press chase storage, storage for 46 8 3/4" x 13" galleys
steel bindery

TOOL, Tite stretch - to set cord in silk screen frame

TOOLS, Linoleum cutting - Millers Falls No. 107 set, six tools, fixed handles
wood carving - Millers Falls No. 106 set, six tools, fixed handles

TRAY, mobile service - cart 24" x 36" x 32" high

TRIANGLES, nickel or stainless steel - 45°/90°, 30°/60°

TYPE, foundry - roman-body, text-formal announcements, italic-accent & attention, Sans Serif-display, script-formal display headings

SOCKETS, wrench - assorted, 3/8" or ½" square drive, 6 or 12 point sockets, deep or standard, ratchet handle, extension, flex handle

WRENCH, Allen - assorted set
box and open end - 3/8" to 1½"

GRAPHIC ARTS: References - Relief Printing Processes

Care and Use of Printers' Rollers, Research and Education Council of Graphic Arts Industry, Washington, D.c., 4615 Forbes Ave., Pittsburgh, Pa. 15213.

Eight Hundred Years of Fine Printing, Carl J. Weber, Colby College Press, Waterville, Me., 1946.

Exploring the Graphic Arts, Marinaccio and Osborn, D. Van Nostrand, New York, N.Y., 1961.

General Printing, Glen U. Cleeton and Charles W. Pitkin, McKnight & McKnight Publishing Company, Bloomington, Illinois, 1963.

Graphic Arts, Darvey E. Carlsen, Chas. A. Bennett Co., Inc., Peoria, Ill., 1965

Graphic Arts Crafts, D. Kauffmann, D. Van Nostrant Co., Inc., N.Y.

Graphic Arts Procedures, R. Randolph Karch, American Technical Society, Chicago, Illinois, 1958.

Graphic Arts Technology, Ray A. Schwalm, McKnight & McKnight Publishing Co., Bloomington, Illinois.

Letterpress and Lithography, Clifford K. Lush, Chas. A. Bennett Co., Inc., Peoria, Illinois, 1963

Origin of Printing and Engraving, Andre Blum, Charles Scribner's Sons, New York, N.Y., 1940.

Practice of Printing, Ralph W. Polk, Charles A. Bennett Co., Inc., Peoria, Illinois, 1962.

Printing, Hartley E. Jackson, McGraw-Hill Book Co., New York, N.Y., 1957.

Printing,F. George Kay, 30 East 74 St., New York, N.Y. 10021, 1968.

Printing and Allied Graphic Arts, C. W. Hague, Bruse Publishing Co., Milwaukee.

Printing and the Allied Trades, R. Randolph Karch, Pitman Publishing Co., New York, N.Y., 1962.

Printing Types: Their Origin and Development, Sol Hess, Diamant Typographic Service, Inc., New York, N.Y., 1947.

Shaping of Our Alphabet, Frank Denam, Alfred A. Knopf, Inc., New York, N.Y., 1955.

A Short History of the Printed World, Warren Chappell, A New York Times Book, N.Y., 1970.

The Story of Printing, Irving B. Simon, Harvey House, Inc., Irvington-on-Hudson, N.Y., 1965.

Theory and Practice of Composition, Government Printing Office, Washington, D.C.

Theory and Practice of Presswork, Government Printing Office, Washington, D.C.

GRAPHIC ARTS: References - Relief Printing Processes - Magazines

Business Graphics, Graphics Arts Publishing Co., 7373 N. Lincoln Ave., Chicago, Illinois, 60646.

Graphic Arts Monthly, Graphic Arts Publishing Co., 7373 N. Lincoln Ave., Chicago, Illinois, 60646.

Industrial Arts and Vocational Education Magazine, The Bruce Publishing Co., 400 N. Broadway, Milwaukee, Wis., 53201.

Inland Printer, Maclean-Hunter Publishing Corp., 300 W. Adams St., Chicago, Illinois, 60606.

Printing Magazine, Walden Sons and Mott, 93 Worth Street, New York, N.Y.

School Shop, Longshore Drive, Box 623, Ann Arbor, Mich., 48107.

GRAPHIC ARTS: References - Silk Screen

Exploring the Graphic Arts, Anthony Marinaccio, D. Van Nostrand Company, New York, 1959.

Graphic Arts, Darvey Carlsen, Chas. A. Bennett Company, Peoria, Ill., 1964.

Graphic Arts, Fredrick Kagy, The Goodheart Wilcox Co., Chicago, Ill. 1961.

Introducing Screen Printing, Anthony Kinsey, Watson-Guptill Publications, N.Y., 1967.

Photographic Screen Process Printing, Albert Kosloff, Sign of the Times Publishing Company, Cincinnati, Ohio, 1962.

Silk Screen Stenciling a Fine Art, J. I. Biegeleisen and M. A. Cohn, McGraw-Hill Book Company, New York.

Silk Screen Printing, James Eisenberg and Francis Kafka, McKnight & McKnight Publishing Co., Bloomington, Illinois, 1952.

The Silk Screen Printing Process, J. I. Giefeliesen and E. J. Busenback, McGraw-Hill Book Co., Inc., 1941.

The Art and Craft of Screen Process Printing, Albert Kosloff, Bruce Publishing Company, Milwaukee, Wisconsin.

GRAPHIC ARTS; References - Offset Lithography

Chemistry of Lithography, Paul Hartusch, Lithographic Technical Foundation Pittsburgh, Pa., 1961.

Exploring the Graphic Arts, Anthony Marinaccio, D. Van Nostrand Co., New York, N.Y., 1961.

Graphic Arts, Darvey Carlsen, Bennett Company, Peoria, Illinois, 1964.

Graphic Arts, Fredrick Kagy, The Goodheart Wilcox Co., Chicago, Ill., 1961.

Halftone Photography for Offset Lithography, Erwin Joffee, Lithographic Technical Foundation, Pittsburgh, Pa., 1960.

How to Do Paste-ups and Mechanicals, Ralph Maurello, Tudor Publishing Co., New York, 1960.

How to Prepare Art and Copy for Offset Lithography, William J. Stevens and John L. McKinven, Dorval Publishing Co., Maywood, New Jersey.

Line Photography for the Lithographic Process, Davis Carl Robinson, Lithographic Technical Foundation, Pittsburgh, Pa.

Letterpress and Lithography, Clifford K. Lush, Chas. A. Bennett Publishing Co., Peoria, Illinois, 1963.

Modern Graphic Arts Paste-up, Gerald A. Silver, American Technical Society, Chicago, Illinois, 1966.

Offset Lithographic Platemaking, Robert Reed, Lithographic Technical Foundation, Pittsburgh, Pa., 1967.

Photography and Platemaking for Photolithography, I. H. Sayre, Lithographic Textbook Publishing Co., Chicago, Illinois, 1951.

Photo-Offset Fundamentals, John Cogoli, McKnight & McKnight Publishing Co., Bloomington, Illinois, 1967.

The Graphics of Communication, Arthur T. Turnbull and Russell N. Bard, Rinehart and Winston, New York, N.Y., 1964.

The Invention of Lithography, Alois Senefelder, The Fuchs and Land Manufacturing Company, New York, N.Y.

The Offset Processes, Karch and E. J. Buber, American Technical Society, Chicago, Illinois, 1966.

What the Lithographer Should Know About Paper, Robert F. Reed, Lithographic Technical Foundation, Pittsburgh, Pa., 1959.